

## <sup>TS2</sup> ***Frame Grabber***



**User's Manual**  
Revision 1.0

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## Explanation of Symbols and Terms

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The following is a list of symbols and important terms that are used throughout this manual. It is assumed that the reader is familiar with the operation of a NEMA TS2 Type Traffic Control System and has qualifications as described in the *Safety Information* section of this manual.



Caution. Risk of danger. This symbol indicates important information that must be read and understood before attempting to install or use the <sup>TS2</sup> **Frame Grabber**.

<b>Frame</b>	A predefined format for the messages that are exchanged using the SDLC protocol. The NEMA TS2 Standard defines command frames (sent by the controller) and responses frames (sent by BIUs and conflict monitors).
<b>FrameView</b>	A PC software application for viewing, sorting, and analyzing frame data.
<b>NEMA</b>	National Electrical Manufacturers Association.
<b>PC</b>	Personal computer
<b>SDLC</b>	Synchronous Data Link Communication Protocol. Serial communication protocol by which the controller, BIUs, and conflict monitor exchange information in a TS2 type traffic control system.
<b>TS 2</b>	Traffic Control Systems Standard published by NEMA (see NEMA).

## Safety Information

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### **IMPORTANT SAFETY INFORMATION !** **READ BEFORE ATTEMPTING TO INSTALL THE** ***TS2 Frame Grabber***

The *TS2 Frame Grabber* should only be installed by qualified and authorized traffic signal technicians who are familiar with generally accepted electrical safety practices, local and national safety codes, the NEMA Standards Publication TS2-2003, and any other relevant codes which may apply to the local traffic signal installation.

## Installation

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Installing the <sup>TS2</sup> **Frame Grabber** in a signal cabinet is quick and simple - normally requiring less than five minutes. The only required connections are DC power and an SDLC cable.

### DC Power Connection

The DC power connection is made with the supplied M8 threaded female molded cable. The threaded end connects to the connector labeled "24 VDC" on the front of the Frame Grabber. The other end of the cable has three leads colored black, blue, and brown. The leads should be connected as follows :

- Blue** : Connect to the cabinet Logic Ground.
- Brown** : Connect to the cabinet +24VDC supply.
- Black** : Not connected.

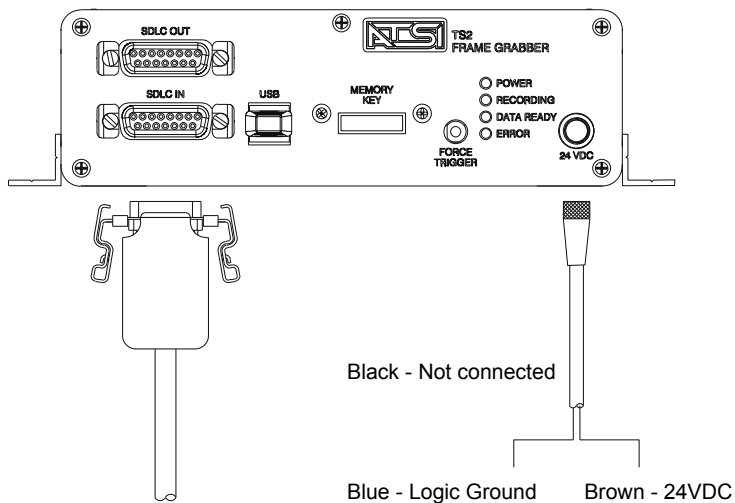
### SDLC Cable Connection

There are two possible methods to make the connection to the SDLC bus. The simplest method is to have a **dedicated communication cable**. If a dedicated cable is not available, the **pass through** method may be used. The two methods are described on the following pages.

#### Dedicated Communication Cable

If the cabinet has an available SDLC communication cable (as described in section 5.3.3 of the TS 2-2003 v02.06 Standard ), simply plug the male DB15 connector into one of the mating female DB15 connectors on the front of the Frame Grabber. This is shown in the drawing on the following page.

## Installation



SDLC Communication Cable from TF

Note that there are two DB15 female connectors on the front of the Frame Grabber. These are labeled SDLC IN and SDLC OUT simply for reference. Both connectors are identical. When connecting in this method you may plug the SDLC communication cable into either connector.

## Installation

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### Pass Through

If a dedicated communication cable is not available, the supplied SDLC pass through cable may be used to connect the Frame Grabber to the SDLC bus.

1. Unplug the Port 1 cable from either a BIU **or** the controller.
2. Plug the cable into the SDLC IN connector on the Frame Grabber.
3. Connect one end of the SDLC pass through cable to the SDLC OUT connector on the Frame Grabber. Connect the other end of the SDLC pass through cable to Port 1 of either the BIU or the controller from 1.

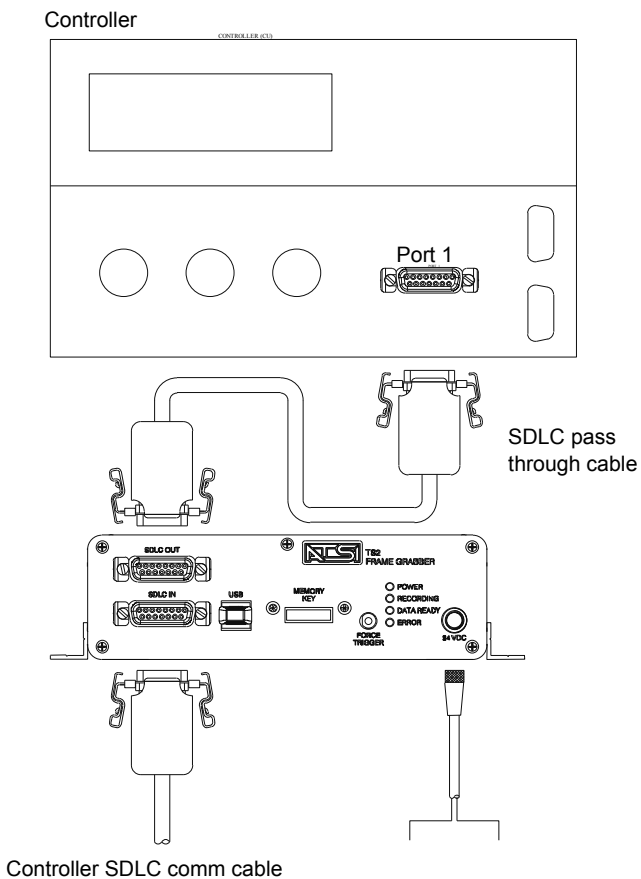
See the drawings on the following two pages.



## Installation

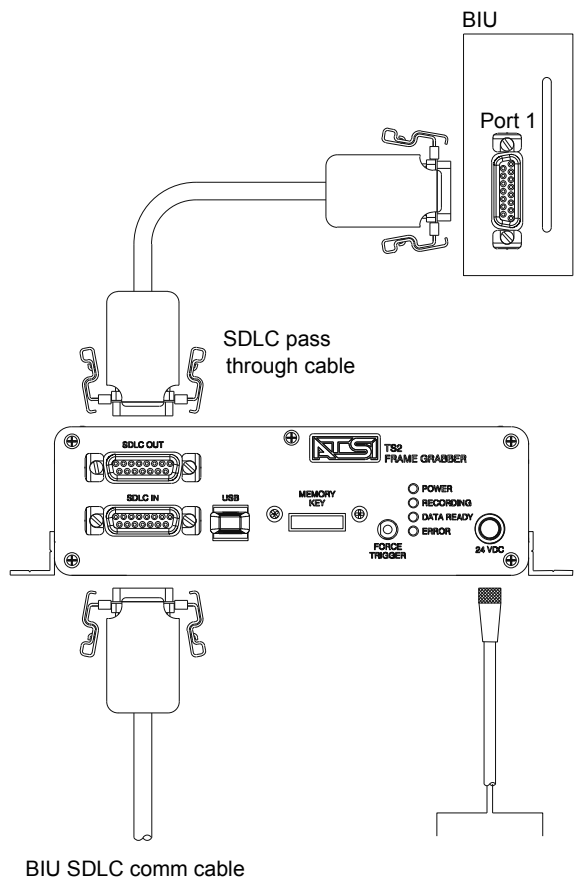
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Pass through connection using the controller SDLC communication cable.



# Installation

Pass through connection using the BIU SDLC communication cable.



## Operation

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This manual contains information on the operation and installation of the <sup>TS2</sup> **Frame Grabber**. In order to analyze the frame data collected collected by the <sup>TS2</sup> **Frame Grabber**, the user must also have the *FrameView* software and memory token reader. The memory token reader may be purchased from ATSI and *FrameView* may be downloaded at [www.atsi-tester.com](http://www.atsi-tester.com). Complete instructions for *FrameView* and the memory token reader are contained in the software help files.

The <sup>TS2</sup> **Frame Grabber** connects to the SDLC bus in a NEMA TS2 cabinet and continually records all frames transmitted between the controller, BIUs, conflict monitor, and other auxiliary devices. The frames are stored in a circular buffer that will hold approximately 20 - 30 minutes\* worth of data.

Once the <sup>TS2</sup> **Frame Grabber** is installed (as described in the *Installation* section), it will automatically begin recording any transmitted SDLC frames as soon as power is applied.

There are two methods of retrieving the recorded frames :

1. The frame data is automatically saved to the removable memory token anytime the conflict monitor reports that the intersection is in a flash condition.

When a <sup>TS2</sup> **Frame Grabber** is permanently installed in the signal cabinet, **the memory token will always have the frame data from the 30 minute period\* leading up to the last flash condition.**

2. Push the "Force Trigger" button to **immediately** save all of the stored data to the memory token.

This method is useful for preventative maintenance, routine troubleshooting, or anytime you want to immediately retrieve the latest data.

The memory token should only be removed when the "DATA READY" LED is on.

\* Actual times may be more or less, depending on cabinet configuration and controller programming.

## Operation

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Once the frame data is saved to the memory token, the token may be inserted into the memory token reader and viewed on a PC with the *FrameView* software application. Using *FrameView*, all of the frame data is presented in an easy to understand graphical format. Powerful filtering and sorting tools allow you to quickly identify communication errors or other intermittent problems that may otherwise go undetected.

### Status LEDs

The following status LEDs are located on the front panel of the <sup>TS2</sup> **Frame Grabber**.

POWER When this LED is on (green), power is applied.

RECORDING Flashing rapidly (~ 8 times/sec ) indicates that valid SDLC frames are being recorded.

Flashing slowly (~ 1 time / sec ) indicates that the SDLC frames are being saved to the removable memory token.

DATA READY When this LED is on (green), the latest SDLC data has been saved to the memory token and the token may be removed.

**NOTE : Do not remove the memory token unless the DATA READY LED is on - or - the ERROR LED is on.**

ERROR When this LED is on (red), there is a problem with the memory token. Either the memory token is not inserted, or it is inserted but is defective. To clear the error, insert a memory token if there is none - or remove the defective token and insert a new one.

### USB Connector

This connector is for future firmware upgrades and is not used for normal operation. A USB port plug is provided and should be left in place at all times when the USB connection is not in use.

# Electrical and Mechanical Specifications

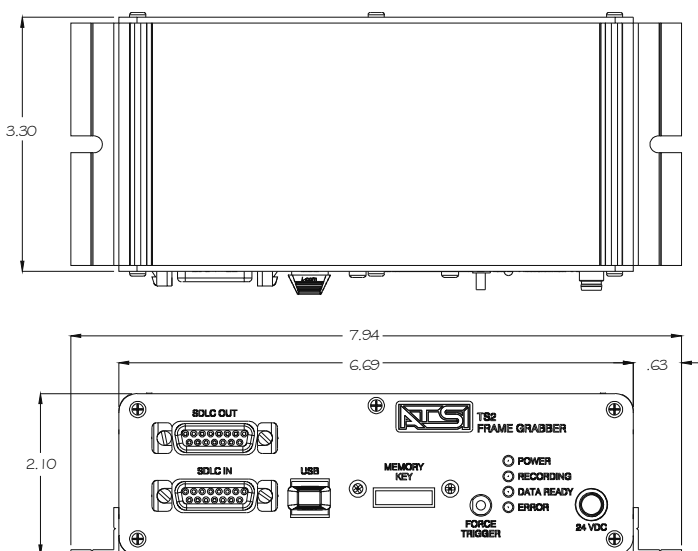
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## Electrical Specifications

Nominal Supply Voltage	: 24 VDC
Operational Range	: 12 - 26 VDC
Initial inrush current	: 1.25 Amps (peak)
Max Operating Current	: 100 mA

## Mechanical Specifications

Enclosure	: Flange Mount, Extruded Aluminum
Dimensions	: 2.11" (H) x 6.68" (W) x 3.15" (L)



## Service and Calibration

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The <sup>TS2</sup> **Frame Grabber** has no user serviceable parts. Under no circumstances should the user attempt to open the enclosure.

If the <sup>TS2</sup> **Frame Grabber** appears to be malfunctioning, contact ATSI to make arrangements for repair. See the Limited Warranty section of this manual for details.

The <sup>TS2</sup> **Frame Grabber** is shipped from the factory completely calibrated and tested. No further calibration should be required.

## Limited Warranty and Return Merchandise

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The <sup>TS2</sup> **Frame Grabber** (Product), distributed by Athens Technical Specialists, Inc. (ATSI), is warranted to the original purchaser (Purchaser) to be free of defects in materials and workmanship for a period of one year from the purchase date stated on the invoice. Within this period, in the event of a defect, malfunction, or other failure of the product while in the custody of the Purchaser, ATSI will remedy the defect or cause of failure without charge to the Purchaser. The Purchaser's sole remedy is restoration of product operation. ATSI accepts no liability for incidental or related expenses. Under no circumstances will ATSI's liability exceed the purchase price for items claimed to be defective.

This Limited Warranty does not extend to any Product that has been damaged or rendered defective as a result of accident, misuse, abuse, modification of the product, or service by anyone other than ATSI.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, ATSI MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ATSI EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

### Warranty Repair

To return the Product for repairs :

Request a Return Merchandise Form by phone, fax, or email from the ATSI Service Department or complete the form at [www.atsi-tester.com](http://www.atsi-tester.com). Return the Product along with the completed form with prepaid postage to :

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